

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603854A Artillery Systems Advanced Development				PROJECT D505	
COST <i>(In Thousands)</i>	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D505 Crusader - Advanced Development	300429	266158	355309	446674	245250	0	0	0	2140620

A. Mission Description and Budget Item Justification: This program element supports the Program Definition and Risk Reduction (PDRR) efforts for the Crusader – Advanced Development Program. The Crusader system is the Army’s next generation self-propelled howitzer (SPH) and artillery resupply vehicles (RSVs) designed to support Army XXI, Joint Vision 2010 and the Future Army. Crusader will have significantly increased capabilities in the areas of lethality, mobility, survivability, resupply, command and control, and sustainability by capitalizing on emerging, advanced technologies. The SPH will also achieve increased lethality levels through independent operations. The RSV will have significantly increased capabilities in the areas of resupply, mobility and survivability and will provide a single source of ammunition, fuel, propellant and other supplies for the SPH.

In consonance with the New Army Vision/Transformation, the Crusader development is being restructured to improve transportability and relevance to the Army’s objective force. The focus of the revised Crusader program is to increase all modes of deployability while retaining all of its Key Performance Parameters. The revised Crusader system will be reduced in weight and volume and employ a change in resupply vehicle philosophy (an equal mix of tracked and wheeled resupply vehicles). The restructured program will leverage the successful development to date and continue development activities that support the revised Crusader concept in conjunction with concept formulation and significant weight reduction initiatives. Major subsystems and technologies remain largely unchanged, but will be repackaged. The program will remain in the Program Definition and Risk Reduction (PDRR) phase to improve deployability and relevance to the Army’s objective force, and transition to Engineering and Manufacturing Development (EMD) in fiscal year 2003.

FY 1999 Accomplishments:

- 264321 Product development: Continued developmental efforts under the Crusader PDRR contract. Continued efforts in support of maturation and continue integration and risk reduction of critical technologies. Initiated long lead item buys. Initiated system prototype fabrication (SPH1/SPH2/RSV1). Completed major component fabrication and demo. Initiated integration and checkout in the Systems Integration Facility (SIF). Selected final System Integration, Assembly, Test and Checkout facility. Delivered RSV- which is the engineering development test article to be used in Automotive Performance/RAM Testing.
- 20606 Support and management: Continued project management efforts; to include scientific and engineering analysis, product development team support and engineering management services.
- 15502 Test and evaluation: Finalized EDT-A testing. Initiated testing of RSV-. Initiated Safety Certification Activity. Purchased of ammunition and propellant for program testing.

Total 300429

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<p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 211648 Product Development: Redirect efforts to develop the lightweight Crusader concept under Crusader PDRR contract. Continue efforts in support of integration and risk reduction of critical technologies. Initiate development/Integration of software release 3 and integrate builds two and three. Complete Electronic Bench Top Developmental System (EBTDS). Integrated Crusader Emulator (ICE) development. Deliver 3.0 Operating System and Services (OSS). Initiate development of new Powerpack/Drive Train (PP/DT). Initiate Component Maturation/Weight reduction initiatives. Deliver SPH1 Emulator to YPG for testing. • 36433 Support and Management: Continue project management efforts; to include engineering analysis, product development team support and engineering management activities. Continue coordination and development of MSII activities in accordance with new program approach. • 11071 Test and Evaluation: Initiate testing of SPH1 Emulator at YPG. Conduct Survivability Risk Reduction tasks (Compartmentation, Vehicle Section Tests - VST) testing. Purchase of ammunition and propellant for program testing. • 7006 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR) <p>Total 266158</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 291239 Product Development: Continue efforts by developing Preliminary Design for lightweight Crusader concepts under Crusader PDRR contract. Continue efforts in support of integration and risk reduction of critical technologies. Checkout and test Software Release 3. Integrate/Assembly of new Powerpack/Drive Train. Initiate Survivability Risk Reduction Tasks. Continue component Maturation/Weight reduction initiatives. Configure turret and Resupply Test Stands and demonstrate system performance/performance growth. • 40128 Support and Management: Continue project management efforts; to include engineering analysis, product development team support and engineering management activities. Continue coordination and development of MSII activities in accordance with new program approach. • 23942 Test and Evaluation: Continue testing of SPH 1 Emulator at YPG. Purchase of ammunition and propellant for program testing. <p>Total 355309</p>		
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B. Program Change Summary	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 2000/2001 PB)	313526	282937	120457
Appropriated Value	317166	268137	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-3640		
b. SBIR / STTR	-11728		
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming	663	-1072	
e. Rescissions	-2032		
Adjustments to Budget Years Since FY 2000/2001 PB		-907	-1206
New Army Transformation Adjustment		TBD	+236058
Current Budget Submit (FY 2001 PB)	300429	266158	355309

Change Summary Explanation: Funding – FY01: Project D505 was adjusted to reflect the New Army Transformation.

C. Other Program Funding Summary	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Comp</u>	<u>Total Cost</u>
RDTE, BA5, Army, PE 0604854, D503			28	39273	227991	452583	425058	Cont	Cont
Procurement, WCTV, Army, G83500						24679	94237	Cont	Cont
Procurement, WCTV, Army, G83600						19096	76408	Cont	Cont
RDTE, BA5, Army, PE 0604854, D2KT	96		199	198	397	1190	199	Cont	Cont
Procurement, Ammo, Army, ER 8021		42601	27432	57713	77553	68091	57706	Cont	Cont
RDTE, BA5, Army, PE 0604645, D175	4259	2877	2200					0	48034
Procurement, Ammo, Army, ER 8017	1502	13951	45633	52839	53449	53487	53437	Cont	Cont

D. Acquisition Strategy: On 29 December 1994, a Sole Source-CPIF contract award was made selecting United Defense, Limited Partnership (UDLP) as the prime contractor for the PDRR phase of Crusader. General Dynamics Land Systems (Warren, MI) and General Dynamics Armament Systems (Burlington, VT) are the major sub-contractors in the areas of mobility and resupply respectively. On 19 March 1996, the Army changed the armament system for Crusader from liquid propellant (LP) to solid propellant (SP) as a consequence of cost and persistent technical problems. In June 1996, UDLP selected the government's Advanced Solid Propellant Armament system (XM297 cannon and Modular Artillery Charge System (MACS) as the basis for SP Crusader). On 6 November 1996, TACOM-ARDEC signed a Memorandum of Agreement (MOA) with UDLP establishing a unique teaming arrangement for the Government to provide engineering services to UDLP for the development of the SP

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armament system. Delay in the decision to switch from LP to SP and alignment of program activities to match fiscal profile required an adjustment in the schedule portion

of the Acquisition Program Baseline (APB). On 23 October 1997, the Office of the Secretary of Defense approved Crusader's revised APB. The revised APB leverages acquisition reform initiatives and features a single continuous objective development path. The seamless transition from PDRR to EMD eliminates inefficiencies in ramping down/up during the milestone decision. The strategy for development of the lightweight Crusader is to build on the successful development to date on major subsystems; e.g. continue development and testing of the XM297 cannon, exercise the resupply subsystem and software in the Systems Integration Facility (SIF), and continue electronics and software development. The strategy is to continue these efforts, without a break, develop weight reduction technologies and initiatives, and re-design the system with the current contractor team.

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Delivery of RSV-	4 th Qtr*						
Safety Certification Activity	4 th Qtr						
Delivery of SPH 1 Emulator & initiate testing		2 nd Qtr					
Integrate new Powerpack/Drivetrain into RSV-			4 th Qtr				
Initiate RSV- testing with new Powerpack/Drivetrain				1 st Qtr			
Milestone II					3 rd Qtr		
Initiate BH&T testing						2 nd Qtr	
Delivery of 1 st EMD Prototype							1 st Qtr
Initiate PPQT testing							1 st Qtr

*Milestone completed

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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY1999 Cost	FY1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Systems Contractor	SS/CPIF	UDLP, Minneapolis, MN	434289	236205	Oct-98	194993	Oct-99	282689	Oct-00	614474	1762650	
b. Systems Development Engineering	PO	ARDEC, Picatinny Arsenal, NJ	34871	18782	Oct-98	8131	Oct-99	3890	Oct-00	1441	67115	
c. Systems Development Engineering	PO	TACOM, Warren, MI	2237	876	Oct-98	814	Oct-99	837	Oct-00	1322	6086	
d. Systems Development Engineering	PO	ARL, Adelphi, MD	2676	2785	Oct-98	2025	Oct-99	1630	Oct-00	470	9586	
e. Systems Development Engineering	PO	Various OGAs	742	5048	Oct-98	4165	Oct-99	1255	Oct-00	600	11810	
f. Systems Development Engineering	Various	Various contracts	163	625	Oct-98	1520	Dec-99	938	Dec-00	0	3246	
Subtotal Product Development:			474978	264321		211648		291239		618307	1860493	

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY1999 Cost	FY1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Development Support	PO	PM Crusader, Picatinny Arsenal, NJ	11816	6582	Oct-98	6993	Oct-99	7165	Oct-00	12250	44806	
b. Development Support	PO	ARDEC, Picatinny Arsenal, NJ	16767	7253	Oct-98	12474	Oct-99	10796	Oct-00	17173	64463	
c. Integrated Logistics Support	PO	RIA, Rock Island, IL	271	130	Oct-98	398	Oct-99	217	Oct-00	453	1469	
d. Development Support	PO	TACOM, Warren, MI	3971	1722	Oct-98	1636	Oct-99	1921	Oct-00	3162	12412	
e. Development Support	PO	ARL, Adelphi, MD	1950	344	Oct-98	815	Oct-99	1160	Oct-00	1515	5784	
f. Development Support	PO	Various OGAs	2171	870	Oct-98	1559	Oct-99	1423	Oct-00	1986	8009	
g. Development Support	Various	Various contracts	4501	872	Oct-98	9746	Oct-99	15386	Oct-00	8043	38548	
Subtotal Support Costs:			41447	17773		33621		38068		44582	175491	

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III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY1999 Cost	FY1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Development Test and Evaluation	PO	TECOM (YPG, AZ; CSTA, APG, MD)	2091	1844	Oct-98	5018	Oct-99	13755	Oct-00	19090	41798	
b. Ammunition and propellant	PO	Various	6029	13658	Oct-98	6053	Dec-99	10187	Dec-00	6953	42880	
Subtotal Test and Evaluation:			8120	15502		11071		23942		26043	84678	

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY1999 Cost	FY1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Project Management Support	SS/FP	Vector Research, Inc., MI	739	670	Nov-98	600	Nov-99	630	Nov-00	1008	3647	
b. Project Management Support	SS/FP	System Research & Integration, Inc., VA	101	160	Nov-98	150	Nov-99	160	Nov-00	306	877	
c. Project Management Support	SS/FP	GSA, VA	130	0	-	0	-	0	-	0	130	
d. Project Management Support	SS/FP	Camber, Inc., NJ	0	150	Nov-98	240	Nov-99	100	Nov-00	0	490	
e. Project Management Support	SS/FP	SAIC, VA	0	849	Nov-98	910	Nov-99	336	Nov-00	417	2512	
f. Project Management Support	SS/FP	Robbins Gioia, VA	0	224	Nov-98	124	Nov-99	129	Nov-00	134	611	
g. Project Management Support	SS/FP	Genisys, TX	0	0	-	150	Nov-99	160	Nov-00	170	480	
h. Systems Engineering Support	SS/FP	PRC, VA	294	0	-	110	Nov-99	115	Nov-00	183	702	
i. Systems Engineering Support	SS/FP	LMI, VA	0	250	Jun-99	0	-	0	-	0	250	
j. Software Development Support	SS/FP	Mitre Corporation, VA	991	280	Nov-98	278	Nov-99	180	Nov-00	274	2003	

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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY1999</u> Cost	<u>FY1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
k. Software Development Support	SS/FP	SAIC, VA	0	250	Dec-98	250	Dec-99	250	Dec-00	500	1250	
l. SBIR/STTR	N/A	N/A	0	0	-	7006	-	0	-	0	7006	
Subtotal Management Services:			2255	2833		9818		2060		2992	19958	
Project Total Cost:				526800	300429	266158		355309		691924	2140620	

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